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Impact of Expanding SSI on Medicaid Expenditures of Disabled Children

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Supplemental Security Income (SSI) expansions for disabled children in the early 1990s provoked criticism that eligibility criteria were too lax and motivated the subsequent retraction of benefits for many children. However, little evidence exists on whether the clinical needs of SSI children declined during this period. The authors used Medicaid data to examine changes in average expenditures between 1989 and 1992, using an Aid to Families with Dependent Children (AFDC) comparison group to control for confounding time trends (e.g., in access). Results showed declines in average expenditures in Georgia and Tennessee but increases in California and Michigan, which are thought to have started with more liberal eligibility policies.

INTRODUCTION

This study examines the impact of expansions to the SSI program in the early 1990s on the Medicaid expenditures of disabled children. In 1990, almost 3.2 million children under age 18 had a chronic health condition limiting their ability to engage in age-appropriate activities such as playing or attending school (Stucki, 1995). During the same time period, only about 294,000 blind and disabled children participated in the SSI program (Committee on Ways and Means, 1991), which is administered and funded by the Social Security Administration (SSA) and offers cash benefits to elderly, blind, or disabled U.S. residents who meet income and asset standards.

In addition to financial ineligibility, one of the reasons for the historically small proportion of children with chronic health problems who participated in the SSI program was SSI's historical definition of disability for minors. For adults, the definition of disability is based on the ability to engage in gainful employment. Because this concept is not meaningful for children, the determination of disability for children traditionally depended on more restrictive medical standards, i.e., whether the child suffered from a mental or physical disorder listed as a "per se" disabling condition. In the early 1990s, however, several changes were implemented in the way SSI eligibility was determined for disabled children, leading to an expansion in the program (U.S. General Accounting Office, 1994). In the Sullivan versus Zebley(493 U.S. 521(1990)) decision of February 1990, the Supreme Court mandated that the determination of disability should rely on individualized functional assessments for children who do not qualify on the basis of medical standards. These regulations, which took effect in February 1991, provided an assessment comparable to the

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criterion used for adults; it permitted the enrollment of children who had multiple health problems, none of which by themselves qualified as a disabling condition, yet which had a combined effect of being disabling (U.S. Department of Health and Human Services, 1991).

The second change was a revision of the medical standards for assessing mental impairment. The new guidelines, published by SSA (1990) in December 1990, incorporated functional criteria and added certain conditions. The list of qualifying mental impairments for children was expanded from 4 general categories to 11, including conditions such as attention deficit hyperactivity disorder (ADHD). This policy change greatly increased the access of children with mental health conditions to SSI.

The third change was increased outreach efforts. Lack of awareness regarding eligibility has been identified as a major impediment to participation in public benefit programs (American Association of Retired Persons, 1992a, 1992b, 1992c; Families U.S.A., 1993). The 1989 Omnibus Reconciliation Act of 1989 (Public Law 101-239) required SSA to establish a permanent program of SSI outreach to low-income children (National Commission on Childhood Disability, 1995). The 1990 *Zebley* decision called for additional outreach efforts, including the readjudication of large numbers of previously denied claims (National Commission on Childhood Disability, 1995). Congress appropriated $3 million for SSA to target hard-to-reach populations in 1990 and $6 million in each of the subsequent 5 years (National Commission on Childhood Disability, 1995). Partly in response to congressional inquiries, SSA began a substantial "child find" program in the late 1980s under the leadership of Commissioner Gwen King, including funding a number of community groups and agencies to help identify children eligible for SSI. This effort helped to heighten awareness of the program among a wide variety of groups that might refer children for disability determination. In particular, organizations providing coordinated services, such as Head Start affiliates and children's hospitals, were targeted (National Commission on Childhood Disability, 1995).

Following these reforms, the number of children receiving SSI cash benefits increased dramatically, from 296,300 at the end of 1989 to 770,500 at the end of 1994 (U.S. General Accounting Office, 1994). Subsequently, however, the Federal Government passed the Personal Responsibility and Work Opportunity Act of 1996 (Welfare Act), which included provisions restricting the SSI program for children and adolescents. New regulations were issued that were intended to eliminate 135,000 disabled children from the rolls and prevent an additional 45,000 children from qualifying for future SSI assistance (Pear, 1997).

This partial reversal may have resulted from concerns raised about whether the SSI eligibility expansions resulted in the enrollment of children who were less disabled than earlier enrollees (National Commission on Childhood Disability, 1995; Hancock, Wingert, and Annin, 1994). Empirical evidence on whether the clinical need of the SSI child population changed during this period is scarce. One study, conducted by the Office of Inspector General (OIG) (1994, 1995), sought to examine the need of newly enrolled SSI children by examining their use of health care. The audit was based on 300 SSI children in 10 States during 1992 and 270 children nationwide who were denied SSI enrollment during the same year. The

data showed that 24 percent of the SSI children with mental impairment had not received medical services within 1 year of enrollment. Fifty-five and 49 percent, respectively, of the 51 children with ADHD were not receiving psychological and pharmacological treatment for their disorder under Medicaid.

The findings of the OIG study should be interpreted with caution. Failure to obtain treatment does not necessarily imply the absence of need. Many of the children were living in States that did not provide automatic Medicaid coverage for SSI recipients or did not cover psychological services other than those in the Early and Periodic Screening, Diagnostic, and Testing benefit. Finally, the results were not compared with similar data from the pre-expansion period to examine changes over time.

In the current study, we examine whether time trends in the utilization patterns of SSI children are consistent with the hypothesis that the expansions resulted in systematic changes in their underlying health care needs. We hypothesize that in response to the regulatory changes, need declined among the population of newly enrolled SSI children, leading to a corresponding decline in their health care expenditures relative to children who enrolled prior to the expansions. Utilization does not measure health care needs per se, because some children with health care needs do not receive services and other children receive unnecessary services. Nonetheless, changes in utilization over time should be correlated with changes in need after controlling for confounding trends in access to care through the use of a comparison group.

We further hypothesize that the magnitude of the change varied by the type of expenditure. If children enrolling in SSI after the expansions were more likely to have multiple, moderately severe conditions (instead of a single, severe condition) than those enrolling before the expansions, more recent enrollees might have been less likely to require hospitalization for any of their disorders but more likely to require visits to the doctor or drugs because multiple conditions were being treated. In this case, one might see declines in average inpatient expenditures over time, yet increases in average physician or drug expenditures.

Expenditures on psychiatric hospitals and other psychiatric facilities are also more likely to have increased than other types of expenditures, as a result of the expanded list of mental health impairments used to define disability. Mental health conditions and mental retardation accounted for more than two-thirds of the growth in SSI awards between 1988 and 1992, including 60 percent of new awards based on medical standards and 82 percent of awards based on the functional assessment methodology (U.S. General Account-ing Office, 1994). SSI children who enrolled after the expansions were diagnosed with ADHD almost three times as often as SSI children enrolling prior to the expansions (Perrin et al., 1999). The diagnosis rate for mental health conditions other than ADHD and mental retardation increased by 63 percent, but the diagnosis rate for mental retardation declined by 29 percent (Perrin et al., 1999).

To test these hypotheses, we used 1989-1992 Medicaid enrollment and claims data on children newly enrolled in SSI in California, Georgia, Michigan, and Tennessee to compare total Medicaid expenditures and expenditures by service category before and after the expansions. SSI beneficiaries were automatically eligible for Medicaid coverage in these four States, so Medicaid

claims can be used to document the services used by SSI children with disabilities in these States. Children with Medicaid coverage through participation in the AFDC program were used as a concurrent control group to account for possible secular trends in Medicaid expenditure patterns over time.

METHODS

Data

The analysis relied on 1989-1992 Medicaid enrollment files and inpatient, outpatient, and long-term care claims for children under the age of 21 in California, Georgia, Michigan, and Tennessee. During the early 1990s, the proportion of Medicaid children whose basis of eligibility was SSI ranged from 1.7 percent to 4.0 percent in three of these four States (Burwell, Crown, and Drabek, 1997). These States were chosen because Medicaid data were available for them through the Tape-to-Tape system. Each of the States was analyzed separately, because of differences in provider reimbursement, benefit structure, population characteristics, and baseline treatment patterns.

Definition of the Sample

The study cohort consisted of children who were newly enrolled in SSI between July 1989 and June 1992. We determined whether the child was SSI-eligible by looking at the basis of Medicaid eligibility for each month (SSI versus AFDC versus other). In Michigan, it was not possible to distinguish whether Medicaid beneficiaries were actual SSI recipients or were instead deemed to be disabled by the State only. The basis of eligibility for children with both individual SSI coverage and family AFDC coverage was recorded as SSI. We used a comparison sample of age- and sex-matched children who were continuously enrolled in Medicaid through AFDC participation in the same year and State as the SSI child. Age categories used for the match were 0-2, 3-5, 6-8, 9-11, 12-14, and 15-17 years old.

Children who were enrolled in health maintenance organizations or had private insurance (except in Georgia, where this information was unavailable) were excluded from analysis, because their data were unlikely to be reliable and complete. Children who were permanently institutionalized were also excluded, because they formed a relatively stable and unique subpopulation that was unlikely to be affected by the eligibility changes. Finally, children who switched to SSI at any point during the study period were excluded from the comparison sample, because the study design assumed that children in the comparison group were subject to the same secular time trends as the SSI children but were not themselves affected by the SSI expansions. Final sample sizes for the SSI children were 24,570 in California, 14,033 in Georgia, 10,125 in Michigan, and 10,277 in Tennessee. The final age-sex matched AFDC samples were not exactly equal in size to the SSI samples because some inclusion and exclusion criteria were imposed subsequent to the matching process.

Time Line

July 1989 through June 1990 is the pre-expansion period, prior to the change in policy. July 1990 through June 1991 is the transition period, when the policy changes were first being implemented. July 1991 through June 1992 is the post-expansion period, after the policy changes had been in effect for a while. Outreach activities

predated the study period and continued throughout, so these time periods mainly allowed examination of the effects of the new mental health criteria and Zebley decision. Data from January-June 1989 were used to determine prior SSI and other Medicaid eligibility and data from June-December 1992 were used to determine expenditures for children enrolled earlier in the year.

Study Design

Simple pre- and post-expansion comparisons of expenditures among newly enrolled SSI children cannot necessarily be attributed to the expansions if other changes affecting expenditures occurred during the same time period (Cook and Campbell, 1979). Possible confounding time trends included changes over time in access to health care providers or Medicaid benefits,[1] medical inflation,[2] increased cost containment by private insurers and employers that changes provider behavior toward all patients. Thus, we used a quasi-experimental design that compared the changes over time within the SSI population with the changes over the same time period within a comparison group of AFDC children (Cook and Campbell, 1979). The use of a comparison group allowed us to identify and "net out" the effect of secular time trends on expenditures as long as the time trends were similar across groups.

Table 1

Quasi-Experimental Study Design

Average Expenditures	SSI Children	AFDC Children
Pre-expansions	E_{11}	E_{12}
Post-expansions	E_{21}	E_{22}

NOTES:SSI is Supplemental Security Income. AFDC is Aid to Families with Dependent Children.

SOURCE:Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

Table 1 shows average expenditures before and after the expansions are respectively denoted as E_{11} and E_{21} for the SSI children and E_{12} and E_{22} for the AFDC children. Assuming that the expansions did not affect the expenditures of AFDC children, we can represent the secular time trend in expenditures as $(E_{22}-E_{12})$. The true effect of the expansions on the expenditures of the SSI children is the total change in their expenditures minus the secular time trend, or $(E_{21}-E_{11})-(E_{22}-E_{12})$. Thus, in order to conclude that the expansions reduced the average expenditures of SSI children, the reduction (increase) in their expenditures would have to be larger (smaller) than the reduction (increase) in the expenditures of the AFDC children. We pool SSI and AFDC children over time to estimate the regression equation:

$$\text{Expenditures} = f(b_0 + b_1X + b_2\text{SSI} + b_3\text{*Transition} + b_4\text{*Post} + b_5\text{*SSI*Transition} + b_6\text{*SSI*Post})$$

X is a matrix of demographic and other control variables, described later. The term SSI indicates whether the child is eligible for Medicaid on the basis of SSI (versus AFDC). The term Transition indicates whether the observation is from the transition period, and Post indicates whether the observation is from the

[1] During the period fiscal year 1989 to fiscal year 1992, Georgia changed its coverage of hospice care and diagnostic, screening, preventive, and rehabilitative services. California changed its coverage of personal and hospice care and diagnostic, screening, and preventive services. Michigan changed its coverage of chiropractor, hospice and respiratory care, and screening services. Tennessee changed its coverage of hospice and respiratory care services, physical therapy, case management, and diagnostic, screening, preventive, and rehabilitative services.

[2] Increases in unit prices over time would bias estimates toward showing higher costs after the SSI expansions, even if actual service use were the same. However, because our outcome measures are Medicaid expenditures and Medicaid increases reimbursement rates only slowly over time, inflation is less of a concern with reimbursement than it would be with charges, even with the study design. Conversely, use of the Consumer Price Index to deflate the expenditure data is inadvisable because it would likely overadjust for actual fee changes.

post-expansion period. Ignoring the demographics, the expected expenditures for an AFDC child during the pre-expansion period would be b_0; the expected expenditures for an SSI child during the pre-expansion period would be $(b_0 + b_2)$. Expected expenditures for AFDC and SSI children during the post-expansion period are $(b_0 + b_4)$ and $(b_0 + b_2 + b_4 + b_6)$, respectively. The difference-in-differences estimator for the effect of the expansions on the expenditures of the SSI group would compare the change over time for the two groups to see whether they were significantly different, i.e., whether $[(b_0 + b_4) - b_0]$ is different from $[(b_0 + b_2 + b_4 + b_6) - (b_0 + b_2)]$. This is equivalent to testing whether b_6, the coefficient of the interaction of being an SSI child and enrolling during the post-expansion period, is significantly different from zero. Similarly, the effect of the transition period is measured by b_5.

Dependent Variables

The primary outcome measure was total Medicaid expenditures. We separately examined inpatient hospital, outpatient hospital, physician, and drug expenditures, as well as expenditures on psychotropic drugs and services provided in psychiatric facilities, including psychiatric hospitals, clinics, etc. For SSI children, the expenditure measures were constructed using claims from the 6-month period following the month of initial enrollment in SSI. For AFDC children, who were continuously enrolled in Medicaid throughout the year, the 6-month period for which expenditures were measured depended on the month of enrollment of the SSI child to whom the AFDC child was matched. For example, AFDC children matched to SSI children enrolling between January and June of a calendar year had their expenditures measured from January through June. AFDC children matched to SSI children enrolling between July and December had their expenditures measured from July through December.

Independent Variables

In addition to time period, basis of Medicaid eligibility, and their interactions, the regressions controlled for age group, sex, race (white versus other than white), and urban status. Information on urban status was obtained by linking the child's ZIP Code of residence to 1990 census data. ZIP Code and hence urban status were not available for Georgia and Michigan. The regressions additionally controlled for Medicaid coverage during the prior 6 months. Our goal was to measure the impact of the expansions on expenditures when non-clinical factors were held constant. One potential bias in this interpretation arises because children who were newly enrolled in SSI following the expansions were more likely to have been previously enrolled in Medicaid than children enrolling before the expansions (Perrin et al., 1998). Preliminary analysis revealed that children already enrolled in Medicaid at the time of SSI enrollment had higher expenditures than those who were not, perhaps because they had already formed ongoing relationships with providers. It is possible that some of these children qualified on the basis of medical need and thus by definition were high utilizers. Thus, to avoid confounding the effect of the SSI expansions per se, we controlled to the extent possible for previous Medicaid experience. (The indicator for previous Medicaid eligibility is measured with error because we do not have complete Medicaid histories, especially for the AFDC children.

However, regression estimates that did not adjust for prior Medicaid eligibility were very close to the original estimates.)

Analysis

Expenditure measures are limited-dependent variables, i.e., they cannot take on negative values but frequently take on zero values. For this reason, we used two-part models, which were specifically developed for the estimation of utilization data (Duan et al., 1983). Medical expenditures result from two choices: first, whether or not to use any services, and second, the level of expenditures, given that services are used. Thus, the expected value of unconditional expenditures can be written as the product of the probability of expenditures and the conditional level of expenditures: $E(\text{Expend}) = pr(\text{Expend} > 0) * E(\text{Expend} \mid \text{Expend} > 0)$.

We estimated the probability of any expenditures as a logit model and the conditional level of expenditures among users as a linear regression with the subsample of children receiving services. A log transformation of the dependent variable and smearing retransformation algorithm (Duan, 1983) were used to account for extreme skewness in the conditional distribution. Thus $E(\text{expenditures of child } i) = S*\exp(X_i\alpha)*(\exp(X_i\beta)/(1+\exp(X_i\beta)))$, where X_i is the vector of regressor values, α and β are, respectively, the vectors of coefficient estimates from the conditional linear regression and logit regression, and S is the smear factor, defined as the mean of the exponentiated residuals. Due to heteroskedasticity, separate smear factors were calculated for each time period (pre, transition, post) and sample (SSI versus AFDC) (Manning, 1998). One implication is that the difference in smear factors can either augment or offset the regressor effect per se; for example, the net increase in expenditures associated with a positive coefficient on the SSI interaction may be smaller or even change sign if the associated smear factor is lower for SSI than AFDC. To test sensitivity, we also estimated the models without a transformation.

For brevity, the tables show only the estimated effects of the SSI expansions. We present the odds ratios and 95-percent confidence intervals from the logit regressions, the coefficients and standard errors from the linear regressions, and the overall changes in the unconditional expectation of expenditures corresponding to the transition and post-expansion periods, $[E(\text{expenditures})_{\text{SSI, post-expansion}} - E(\text{expenditures})_{\text{SSI, pre-expansion}}]$ $[E(\text{expenditures}_{\text{AFDC,post-expansion}} - E(\text{expenditures})_{\text{AFDC, pre-expansion}}]$. $E(\text{expenditures})$ was calculated by using the appropriate values for SSI and time period, keeping other regressors at their original values, and taking the sample mean of the predictions. Standard errors were derived from a first-order Taylor series expansion.[3]

RESULTS

Population Characteristics

Certain trends are consistent across all States (Table 2). Relative to the pre-expansion period, the proportions of SSI children who were female, white, and between the ages of 12 and 17 declined significantly during the transition and post-expansion periods, while the proportion of children between the ages of 6 and 11 increased. The proportion of children in the youngest age group (0-5) remained about the same over time. No clear-cut pattern of urban

[3] The Taylor series formula is $Var[f(\theta)] = f(\theta)^T Var(\theta) f'(\theta)$. With K regressors in the model, $f(\theta)$ is a column vector of first derivatives with dimensions $2Kx1$, $f=(\theta)^T$ is its transpose (a row vector with dimensions $1x2K$), and $Var(\theta)$ is a block-diagonal variance-covariance matrix with dimensions $2Kx2K$.

Table 2

Demographic Characteristics of Newly Enrolled SSI Children: Selected States, 1989-1992

State and Time of Initial Enrollment	Sample Size	Characteristic					
		Female	White	Urban	Age 0-5	Age 6-11	Age 12-17
California				Percent			
Pre-expansions	6,269	43	36	50	45	25	31
Transition Period	7,864	41	35	89	46	27	27
Post-expansions	10,437	40	33	91	45	28	27
P -value	—	$p = 0.01$	$p \leq 0.001$	$p < 0.001$	$p = 0.34$	$p \leq 0.001$	$p \leq 0.001$
Michigan							
Pre-expansions	1,930	41	74	—	32	26	41
Transition Period	3,206	38	75	—	36	30	34
Post-expansions	4,989	37	55	—	30	36	34
P -value	—	$p = 0.02$	$p \leq 0.001$	—	$p \leq 0.001$	$p \leq 0.001$	$p \leq 0.001$
Georgia							
Pre-expansions	2,991	40	40	—	41	29	31
Transition Period	4,776	39	33	—	37	31	32
Post-expansions	6,266	37	30	—	37	33	30
P -value	—	$p = 0.03$	$p \leq 0.001$	—	$p \leq 0.001$	$p \leq 0.001$	$p = 0.336$
Tennessee							
Pre-expansions	1,941	41	58	68	36	29	35
Transition Period	3,134	39	51	65	34	34	32
Post-expansions	5,202	36	44	66	34	36	31
P -value	—	$p \leq 0.001$	$p \leq 0.001$	$p = 0.03$	$p = 0.07$	$p \leq 0.001$	$p = 0.002$

NOTES: SSI is Supplemental Security Income. Pre-expansion period is July 1989-June 1990; transition period is July 1990-June 1991; and post-expansion period is July 1991-June 1992. *P*-values are from chi-square tests of differences in the characteristic across time periods within each State.

SOURCE:Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

status emerged; although the proportion of SSI children living in urban areas increased dramatically in California over this time period, it actually declined slightly in Tennessee, and data on urban status were unavailable in the other States. The data showed a decline over time in the proportion of SSI children who were white, while all States but California showed small increases over time in the proportions of age-sex-matched AFDC children who were white.

Unadjusted Changes in Expenditures over Time

Substantial variation in the probability of use and mean level of expenditures among users was seen among States (Tables 3 and 4). For example, after the expansions, the proportion of SSI children who had any expenditures during the 6 months following enrollment ranged from 54 percent in Tennessee to 79 percent in California, while the mean levels of expenditures among users of services ranged from $1,748 to $4,150. Among both SSI and non-SSI children, the proportion of SSI children with any expenditures during the 6-month period following initial enrollment and the conditional level of expenditures increased in California and Michigan and stayed the same or declined in Georgia and Tennessee. All of the time trends were statistically significant for the SSI sample, and most were significant for the AFDC comparison sample.

Effects of Expansions on Total Expenditures

If the children newly enrolling in SSI after the expansions were less sick than those enrolling before the expansions,

Table 3

Total Medicaid Expenditures of SSI Children During 6-Month Period Following Initial SSI Enrollment: Selected States, 1989-1992

State and Time of Initial Enrollment	Sample Size	Percent with Any Expenditures During 6-Month Followup	Mean Expenditures Among Those with Expenditures		Median Expenditures Among Those with Expenditures
			Mean	Standard Deviation	
California					
Pre-expansions	6,269	61	$3,818	$14,986	$83
Transition Period	7,864	76	3,065	11,684	295
Post-expansions	10,437	79	4,150	21,756	396
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$
Michigan					
Pre-expansions	1,930	65	$2,527	$8,730	$299
Transition Period	3,206	72	2,751	9,630	273
Post-expansions	4,989	74	2,650	10,107	386
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$
Georgia					
Pre-expansions	2,991	73	$3,704	$10,719	$433
Transition Period	4,776	65	3,166	9,497	329
Post-expansions	6,266	72	3,383	9,847	452
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$
Tennessee					
Pre-expansions	1,941	52	$2,126	$7,015	$283
Transition Period	3,134	50	2,180	6,250	324
Post-expansions	5,202	54	1,748	5,878	136
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$

NOTES: SSI is Supplemental Security Income. *P* -values are from chi-square tests of the differences across time periods within each respective State in the probability of any use, ANOVA tests of the differences in the log of conditional expenditures, and Wilcoxon tests of the differences in location parameters for conditional expenditures.

SOURCE:Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

then all else being equal, one might expect that SSI children enrolling during or after the expansions would have been less likely to use services than those enrolling prior to the expansions. Evidence to support this hypothesis was inconsistent, as the probability of any use declined only in Georgia and Michigan (Table 5). In California, the probability of expenditures increased among the SSI sample both in absolute terms and relative to the AFDC children; in Tennessee, the probability of expenditures did not increase in absolute terms, but because it declined substantially among AFDC children, there was an increase relative to the comparison group.

Similarly, there were no consistent patterns across States in the changes over time in the level of expenditures among children who used services, with conditional expenditures increasing significantly in California, declining significantly in Georgia, and being insignificant in Michigan and Tennessee. After combining these regressor effects with the smearing estimates, the combined effects of the expansions on overall, unconditional, expected expenditures followed more of a geographic pattern, with expenditures increasing in California and (in the post-expansion period) Michigan but declining in the southern States, Georgia and Tennessee.

Sensitivity analyses revealed that without using a transformation and smearing retransformation algorithm for the conditional expenditure equations, the estimates were much less efficient and for the most

Table 4

Total Medicaid Expenditures of AFDC Children in Comparison Sample Matched for Age, Sex, and Time Period: Selected States, 1989-1992

State and Time of Initial Enrollment	Sample Size	Percent with Any Expenditures During 6-Month Followup	Mean Expenditures Among Those with Expenditures		Median Expenditures Among Those with Expenditures
			Mean	Standard Deviation	
California					
Pre-expansions	5,389	61	$278	$1,560	$60
Transition Period	7,410	62	268	1,514	68
Post-expansions	9,294	70	378	1,800	135
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$
Michigan					
Pre-expansions	1,407	44	$297	$1,149	$103
Transition Period	2,491	77	353	1,191	114
Post-expansions	5,124	70	387	1,459	128
P -value	—	$p \leq 0.001$	$p = 0.01$	—	$p = 0.002$
Georgia					
Pre-expansions	2,798	70	$461	$1,159	$131
Transition Period	3,510	68	402	1,013	137
Post-expansions	5,616	69	435	1,208	134
P -value	—	$p = 0.10$	$p = 0.82$	—	$p = 0.56$
Tennessee					
Pre-expansions	1,257	71	$745	$3,938	$136
Transition Period	2,989	67	456	1,460	143
Post-expansions	3,660	59	369	1,288	69
P -value	—	$p \leq 0.001$	$p \leq 0.0001$	—	$p \leq 0.0001$

NOTES: AFDC is Aid to Families with Dependent Children. *P*-values are from chi-square tests of the differences across time periods within each respective State in the probability of any use, ANOVA tests of the differences in the log of conditional expenditures, and Wilcoxon tests of the differences in location parameters for conditional expenditures.

SOURCE:Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

part, not significant. The effects of the expansions on average expenditures in California and Georgia during the post-expansion period were still significant and, respectively, positive and negative, but the effect of the transition period in Georgia became positive and significant, and all other effects were insignificant.

Effects on Expenditures by Service Category

No pattern emerged regarding changes in average expenditures within service categories over time (Table 6). In California, average inpatient hospital expenditures declined over time, while outpatient, physician, and drug expenditures increased. For the remaining States, changes over time in the inpatient expenditures of SSI children relative to AFDC children were insignificant, and results for outpatient, physician, and drug expenditures did not indicate any particular pattern. Average psychiatric expenditures increased significantly in Georgia and Tennessee during the post-expansion period but declined significantly in California and Michigan during the transition period.

DISCUSSION

This study examined whether the SSI expansions of the early 1990s resulted in less needy children coming onto the rolls. Although children qualifying for SSI coverage are, by definition, required to provide evidence of a chronic and disabling

Table 5

Estimated Effect of Expansions on Total 6-Month Medicaid Expenditures of Newly Enrolled SSI Children: Selected States, 1989-1992

State and Time of Initial Enrollment	Whether Child Had Any Expenditures: Odds Ratio	Whether Child Had Any Expenditures: 95-Percent Confidence Interval	Level of Log (Expenditures), Conditional on Use: Level	Level of Log (Expenditures), Conditional on Use: Standard Error	Expected Value of Unconditional Expenditures: Level	Expected Value of Unconditional Expenditures: Standard Error
California						
Transition Period	***2.04	1.84, 2.28	***0.82	0.06	***Δ = $1,290	$42
Post-expansions	***1.56	1.41, 1.73	***0.28	0.05	***Δ = $794	41
Michigan						
Transition Period	***0.24	0.20, 0.29	-0.07	0.09	***Δ = -$243	55
Post-expansions	***0.41	0.35, 0.49	0.06	0.09	***Δ = $218	53
Georgia						
Transition Period	***0.60	0.51, 0.70	***-0.46	0.07	***Δ = -$919	82
Post-expansions	***0.76	0.66, 0.89	**-0.18	0.06	***Δ = -$394	81
Tennessee						
Transition Period	1.00	0.82, 1.21	0.05	0.10	***Δ = -$410	89
Post-expansions	***1.60	1.33, 1.92	-0.05	0.09	***Δ = -$556	82

*** Significant at $p < 0.001$.

** Significant at $p < 0.01$.

NOTES: SSI is Supplemental Security Income. The odds ratios approximate *pr*(any expenditures during the transition or post-expansion period)/*pr*(any expenditures at baseline). Regressions also control for a constant, age group, sex, race, basis of Medicaid eligibility, prior Medicaid coverage, time period, and urban status. The effects of the SSI expansions on the probability of any expenditures and conditional level of expenditures are derived from the estimated coefficients on the SSI* time period interactions. The change in unconditional expenditures is calculated as the mean across the entire sample of [E(expenditures)SSI, post-expansion -E(expenditures)SSI, pre-expansion]-[E(expenditures)AFDC, post-expansion-E(expenditures)AFDC, pre-expansion].

SOURCE:Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

condition, once enrolled, these children may not demonstrate patterns of medical use that are consistent with the existence of health care needs (holding access constant). Based on an analysis of the Medicaid expenditure patterns of newly enrolled SSI children, we conclude that there is no compelling evidence that systematic shifts in the medical needs of this population occurred during this period of time, although individual States experienced increases or decreases in SSI expenditures consistent with the hypothesis of changing clinical need. For example, average expenditures increased in California and Michigan during the post-expansion period but decreased in Georgia and Tennessee. Thus, in some States, children who were newly enrolled in SSI following the expansions received less medical attention than those enrolling prior to the expansions, while in other States, the opposite was true.

In California, the pattern of results for average expenditures by service type was consistent with a story in which children newly enrolled in SSI after the expansions were more likely than those enrolling prior to the expansions to have multiple, less severe conditions rather than a single, highly disabling condition. Such children may never become ill enough to require hospitalization, yet may also be less likely to go through periods in which they have no need for medical services, because of their wide range of problems. At the same time, however, an examination of the trends across all of the States did not provide much support for these conjectures. Furthermore, no consistent evidence was

Table 6

Estimated Effect of SSI Expansions on 6-Month Medicaid Expenditures, by Type of Service: Selected States, 1989-1992

State and Time of Initial Enrollment	Inpatient		Outpatient		Physician		Prescription Drug		Psychiatric	
	Level	Standard Error	Level	Standard Error	Level	Standard Error	Level	Standard Error	Level	Standard Error
California										
Transition Period	***Δ = -$521	$137	***Δ = $133	$5	***Δ = $87	$4	***Δ = $11	$2	*Δ = -$112	$47
Post-expansions	**Δ = -$409	137	***Δ = $152	5	***Δ = $29	4	*Δ = $5	2	Δ = -$9	47
Michigan										
Transition Period	Δ = -$82	126	Δ = -$15	12	***Δ = -$30	6	***Δ = -$31	4	**Δ = -$84	33
Post-expansions	Δ = -$55	121	***Δ = $113	14	Δ = -$10	6	*Δ = -$7	4	Δ = $11	33
Georgia										
Transition Period	Δ = -$90	92	***Δ = -$82	12	***Δ = -$102	14	Δ = $4	3	Δ = -$3	6
Post-expansions	Δ = $6	90	*Δ = -$27	12	***Δ = -$57	14	**Δ = $7	3	***Δ = $34	6
Tennessee										
Transition Period	Δ = -$9	118	*Δ = $38	20	Δ = $15	11	Δ = $5	3	Δ = $87	84
Post-expansions	Δ = -$167	108	**Δ = -$45	17	***Δ = -$40	10	***Δ = $11	3	*Δ = $180	83

*** Significant at $p < 0.001$.

** Significant at $p < 0.01$.

* Significant at $p < 0.05$.

NOTES: SSI is Supplemental Security Income. Regressions also control for a constant, age group, sex, race, basis of Medicaid eligibility, prior Medicaid coverage, time period, and urban status. The change in unconditional expenditures is calculated as the mean across the entire sample of $[E(\text{expenditures})_{SSI,\ \text{post-expansion}} - E(\text{expenditures})_{SSI,\ \text{pre-expansion}}] - [E(\text{expenditures}_{AFDC,\ \text{post-expansion}} - E(\text{expenditures})_{AFDC,\ \text{pre-expansion}}]$.

SOURCE: Ettner et al., UCLA School of Medicine, Los Angeles, California, 1999.

found to support the hypothesis that psychiatric expenditures increased over time due to the increasing proportion of SSI children who were eligible on the basis of psychiatric disability.

Our discrepant findings across States could result from variability in any number of factors, including the implementation of the new guidelines and outreach efforts by States. To explore possible explanations, we contacted State staff members to obtain anecdotal information on the expansions. Stories can be told to explain the results for each of our study States, although the most plausible explanation may simply be that States starting off with more restrictive policies were more likely to add "marginal" children to the SSI rolls following the expansions and thus to experience declines in average expenditures. All States added children to the SSI caseload. Yet less restrictive States may have had a heterogeneous clinical mix of children to begin with. The clinical composition of the populations added after the expansions might therefore also have been heterogeneous, suggesting that expenditures would not necessarily decline in response.

For example, the southern States are thought to have been relatively strict in their determination of SSI eligibility, which was cited by one State staff member as a possible reason why the Zebley lawsuit originated in the South. Thus, it is perhaps not surprising that Georgia and Tennessee are the two States showing significant declines in the average Medicaid expenditures of SSI children relative to AFDC children in the post-expansion period. In contrast, California and Michigan experienced relative increases in the Medicaid expenditures of SSI children following the expansions. California is known for having strong child advocacy groups, and its process for determining children's eligibility for SSI was relatively liberal to begin with. Thus, we speculate that California's child SSI population may have already included children who would not have become eligible in the southern States until after the expansions were implemented. California is also relatively unique in the size of its immigrant population. Some of the less disabled children who might have qualified for SSI after the expansions may not have applied, to avoid the risk that their parents' illegal-alien status would be detected.

Outreach efforts in Michigan involved neonatal intensive care units, with a strong push to enroll disabled neonates early, apparently including more lenient evaluation of the parents' income eligibility when the child was at the newborn stage. These babies tend to be extremely sick and costly. The addition of large numbers of costly neonates to the child SSI population could account for the increases in their average Medicaid expenditures over time. The timing of the effects is explained by the fact that outreach efforts in Michigan were not fully implemented until February 1992, after the fiscal analysis was delivered in July 1991. Although all of these statements are conjecture, they highlight both the need to understand what happened at the individual State level and the desirability of looking at overall patterns across all States before attempting to draw national policy conclusions.

Study Limitations

Our study has certain limitations that should be taken into account in interpreting the results. The validity of the quasi-experimental study design relies on the assumption that the time trends among AFDC children are similar to those among SSI children. If all other factors affecting expenditures remained constant or changed in a comparable fashion for the

AFDC and SSI children, then changes in expenditures are likely to be reflective of changes in underlying clinical need. However, changes over this period of time in factors affecting the utilization of AFDC children differently than the utilization of SSI children will bias the difference-in-differences estimates. This bias could occur, for example, if access to care decreased among SSI but not AFDC children independently of the expansions, or if the fees paid to the health care providers of children with disabilities increased less than the fees paid to the providers of healthy children, or if the Medicaid expansions affected AFDC participation and hence the characteristics of our comparison group. Unfortunately, we do not have satisfactory measures of illness severity to directly test the hypothesis that the expansions changed the clinical composition of newly enrolled SSI children.

Expenditures reflect reimbursement policies rather than the actual cost to society of providing services. Moreover, these measures include only services reimbursed by Medicaid, so out-of-pocket and private insurance costs are excluded, as are services for which providers do not bother billing Medicaid because of low reimbursement rates. These limitations will bias the results to the degree that they affect the AFDC comparison group differently than the SSI study group.

Following the Zebley decision, the district court required States to contact the families of 452,000 children who had been denied SSI benefits between January 1980 and February 1991 (National Commission on Childhood Disability, 1995). About 135,000 of these children were ultimately awarded SSI benefits, and those who had been eligible at the time of initial application received large retroactive lump-sum payments. In such cases, it is possible that the start date of Medicaid coverage was recorded in the Medicaid eligibility files as the retroactive date of SSI coverage rather than the actual date that the child learned of his or her coverage. Some of the SSI children newly enrolled after the expansions may have had retroactive Medicaid coverage, biasing our results toward finding declining expenditures over time. Despite this potential bias, however, no consistent evidence of such trends across States was seen.

We examined data only for four nonrepresentative States, accounting for about 25 percent of children enrolled in Medicaid (Health Care Financing Administration, 2000), so our findings may not generalize to the national population. In Michigan, some children who were disabled but not actually enrolled in SSI were erroneously labeled as enrolled, leading to measurement error. It was not possible to determine exactly when the regulatory changes were actually carried out and enforced, and the timing varied across States. If changes took place earlier or later than suggested by our definition of the pre, transition, and post periods, there may be biases toward not finding an effect of the expansions.

Finally, we do not have information on how each individual child was affected by the SSI expansions, so the analysis assumes that on the margin, the eligibility of some of the SSI children in our sample was affected by the expansions. In particular, we cannot distinguish children who were already eligible for SSI and enrolled as the result of outreach from children who were newly eligible. Although outreach efforts had already begun by the beginning of our measurement period in 1989, these efforts were accelerated during the early 1990s. Even with SSA data, this distinction would be difficult to make, because diagnoses recorded by SSA staff as the basis of

eligibility may be those most expedient for the purpose of getting children onto the rolls, rather than reflective of the disorders actually causing the disability. We hypothesize that children who were previously eligible but did not participate in the program were also less severely ill on average than those already participating. If not, then the inconsistencies in our findings across States may result in part because some States put more effort into enrolling children who were already eligible while others focused on the newly eligible.

Policy Implications and Future Research Areas

The rapid rise in child SSI enrollment following the expansions provided the impetus for critics to charge that the new eligibility criteria were too lax (Hancock, Wingert, and Annin, 1994; Woodard and Weiser, 1994; National Commission on Childhood Disability, 1995). In particular, the functional assessment process, which accounted for about 30 percent of the SSI awards made to disabled children between 1988 and 1992 (U.S. General Accounting Office, 1994; Loprest, 1995), came under attack. Yet there has been little hard evidence to date to either support or refute the view that many of the newly eligible children were not sick enough to be "deserving" of SSI benefits, and the anecdotal evidence cited was not necessarily objective (National Academy of Social Insurance, 1995; Silverstein and Cockburn, 1995). Although 31 percent of the children enrolled in SSI during 1992 qualified on the basis of the individualized functional assessments, this figure was comparable to the proportion of adults who qualified for SSI on the basis of functional capacity (U.S. General Accounting Office, 1994). Furthermore, some of these children might have been eligible under the old rules, but the adjudicators found it easier to apply individualized functional assessments.

The issue of whether the criteria for SSI eligibility were made too loose as a result of the Zebley decision and the mental impairment listings remains much in the forefront of policy discussions regarding SSI children. The 1996 Welfare Reform Act changed the definition of childhood disability; in so doing, it tightened eligibility criteria for SSI. The Administration released new regulations regarding this legislation in early 1997, clearly tightening the criteria. Over the next several months, more than 250,000 cases were reviewed, and more than 100,000 children lost benefits. Yet concerns regarding the Administration's implementation of the regulations led to a top-to-bottom review of the childhood redeterminations by the new SSA administrator, Kenneth Apfel, and the reinstatement of many children who had been denied benefits. Concerns regarding the appropriateness and fairness of the process led to Senate hearings in July 1998. Throughout this process, essentially no information regarding the necessity of tightening the SSI eligibility criteria, other than anecdotes, helped to inform these policy changes.

If large numbers of children with lower medical needs had entered the SSI program as a result of the expansions, we might expect to find declines in average expenditures during the later time periods, unless other factors changed simultaneously that were not controlled in the quasi-experimental study design. In certain States, our conclusions might provide some reassurance to policymakers who fear that SSI eligibility criteria are not being implemented in a sufficiently strict fashion and that the recent years have seen a number of relatively healthy children getting onto the rolls. However, other States did show declining average expendi-

tures over the same time period as the SSI expansions, suggesting an empirical basis for this concern in those States.

Our study highlights the importance of policy issues surrounding the SSI child program and suggests fruitful areas for further research. For example, our findings suggest that many of the children who were newly enrolled in SSI following the expansions had considerable medical use and in this sense were just as likely to be needy as children enrolling prior to the expansions. However, the question remains as to whether the medical needs of SSI children could be met through expanded Medicaid eligibility alone. A distinction must be made between the actual cash benefit associated with the SSI program and the medical insurance provided to children with disabilities through the Medicaid coverage that typically follows automatically from SSI eligibility. Part of the concern surrounding the SSI program stems from the view that cash awards are not necessary for children. Unlike disabled adults, who are financially responsible for themselves and who therefore need income replacement if they cannot work, children must be financially supported by adults regardless of their disability status. Thus, it has been argued that cash payments to indigent children with disabilities are unnecessary and that access to Medicaid insurance for this population can be provided even in the absence of SSI, as in many cases it already is (e.g., through medical-need programs).

However, cash benefits for children with disabilities may be justifiable on a number of grounds (Loprest, 1995). For example, cash benefits may replace income for parents who are forced to cut back on employment in order to care for the child. Such benefits may also be used to pay for medical equipment, services not covered by Medicaid (U.S. General Accounting Office, 1994), special educational materials, tutors, or even transportation to medical providers. Insufficient research has been done to examine the extent to which cash awards are either needed or actually used for such purposes. Although a serious investigation of these issues is beyond the scope of the current study, the question of whether a cash benefit for disabled children is appropriate (and what amount is appropriate for different types of disability) is a matter of considerable policy importance that should be the focus of future research.

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